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Bending the curve of biodiversity loss needs urgent, integrated and transformative action

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COP 15 - CP/MOP10-NP/MOP4
Ecological Civilization-Building a Shared Future for All Life on Earth
KUNMING — MONTREAL

5th Science-Policy Forum | Dec. 11th 2022 | Montreal, Canada
United Nations Biodiversity Conference

Outline

- Insights from the bending the curve study: a model & scenario example

- Additional insights from GEOBON / Future Earth bioDISCOVERY expert group

- How can models & scenarios help in the implementation phase and better account for issues of social justice and diverse values?
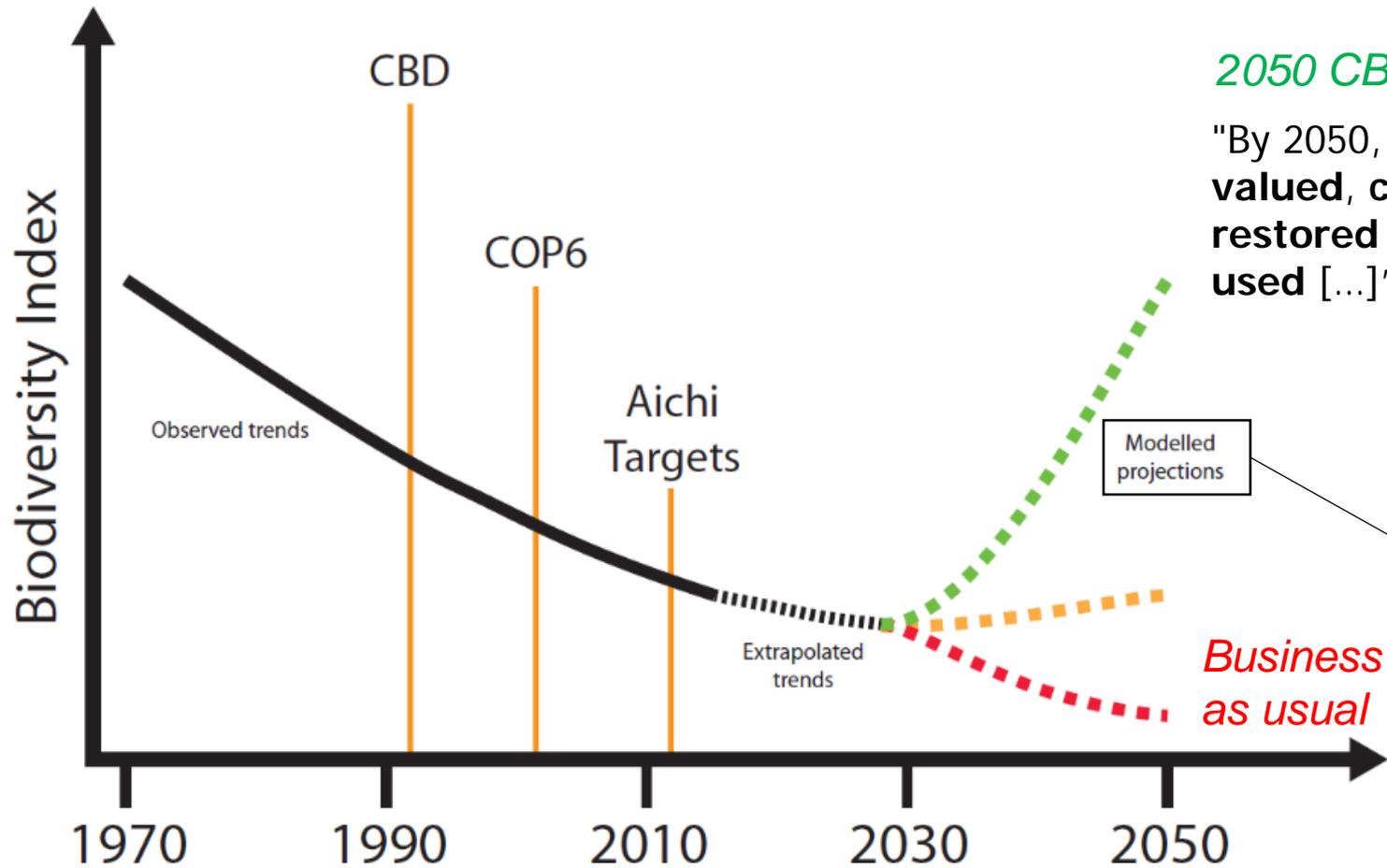
What do we mean by "bending the curve" of biodiversity

Mace et al. (2018)

Scenarios and modeling groups have taken up this challenge
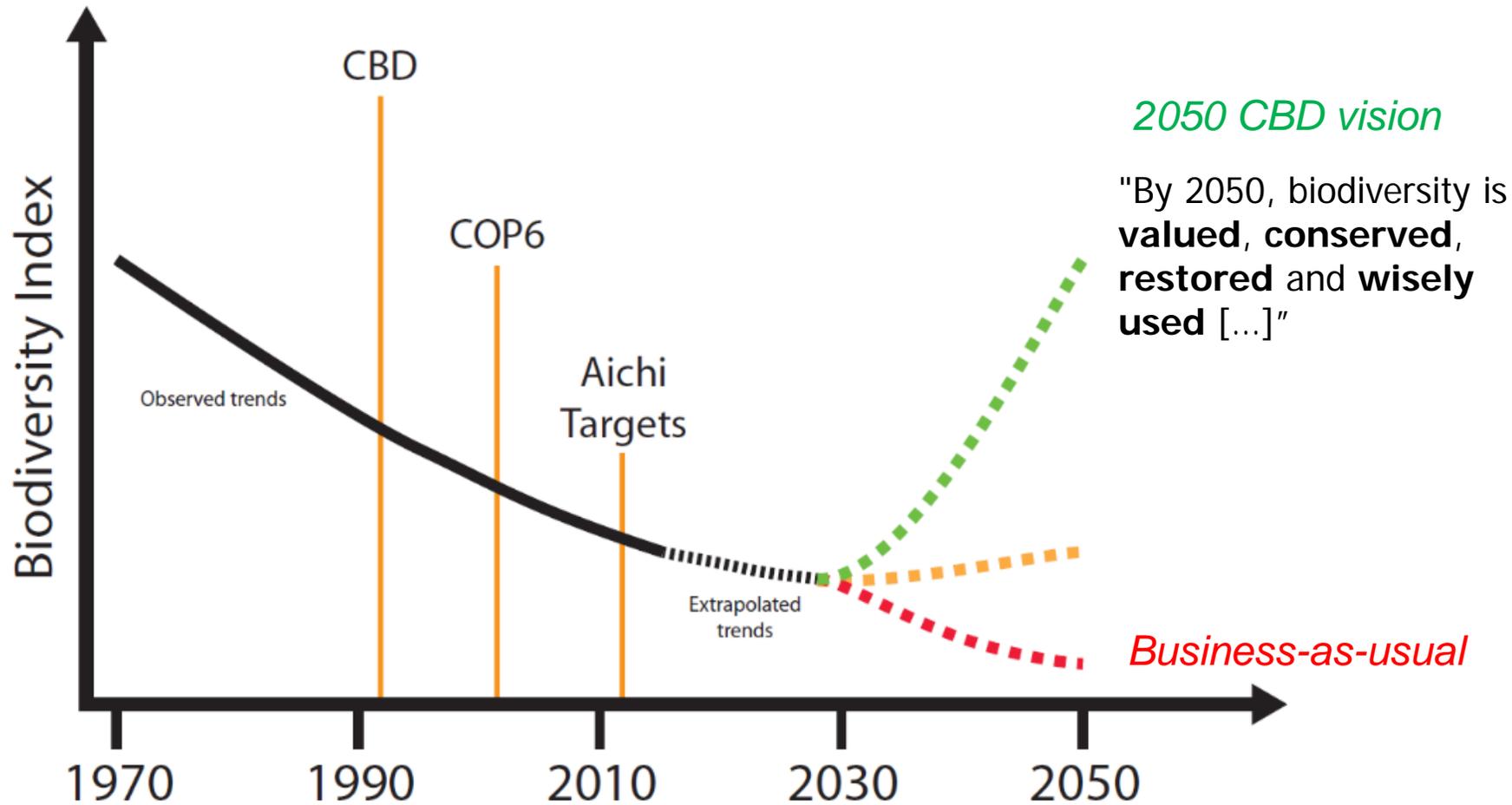
Meet Sustainable Development Goals

2050 CBD vision

"By 2050, biodiversity is **valued**, **conserved**, **restored** and **wisely used** [...]"

The methodological assessment report on
SCENARIOS AND MODELS OF BIODIVERSITY AND ECOSYSTEM SERVICES

SUMMARY FOR POLICYMAKERS

Ferrier et al. (2016)

ipbes

Business as usual

Mace et al. (2018)
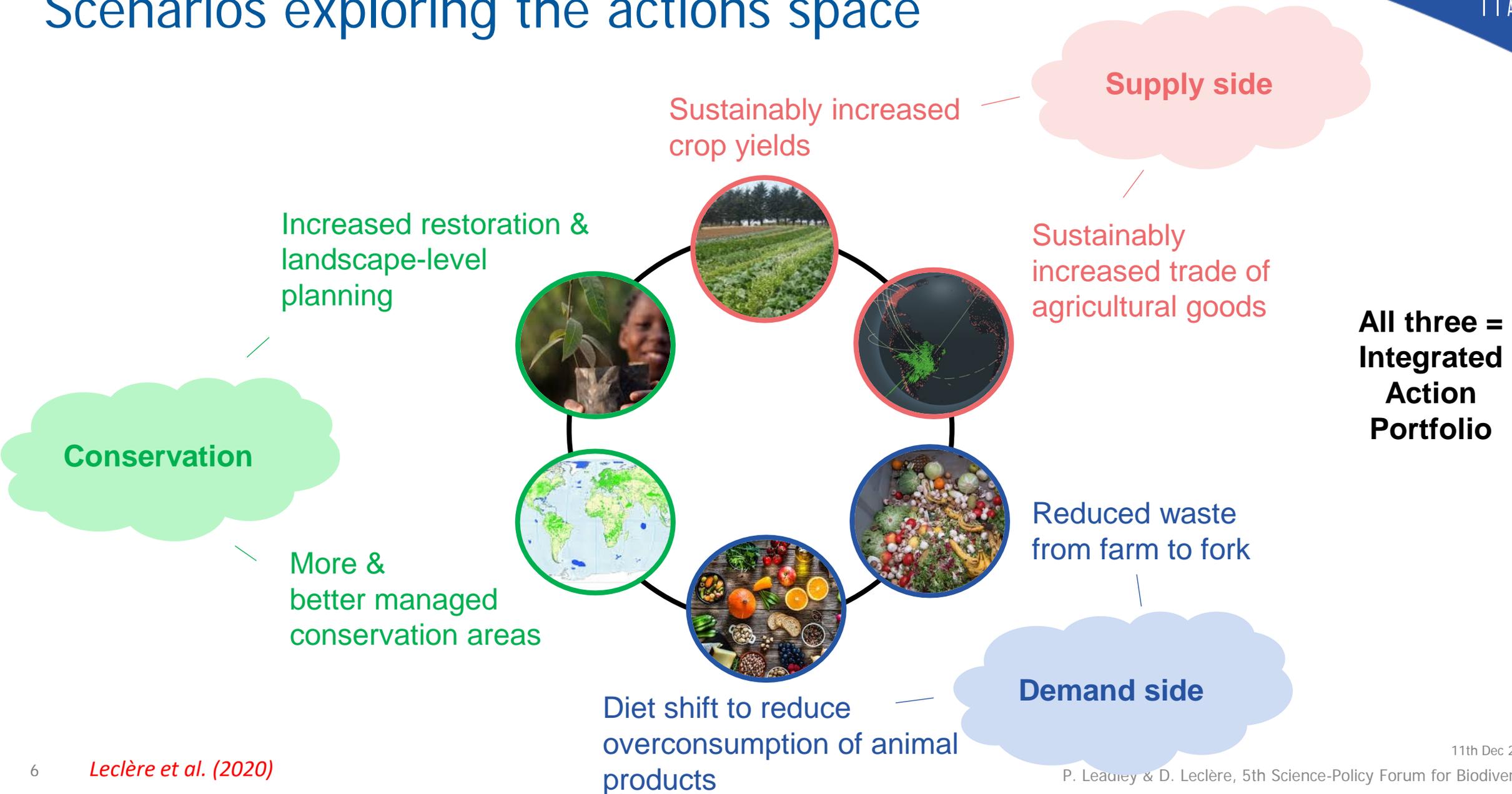
The bending the curve initiative

- Combining data, models & scenarios from land-use & biodiversity modelling communities

- Fast track analysis on bending trends from habitat loss:

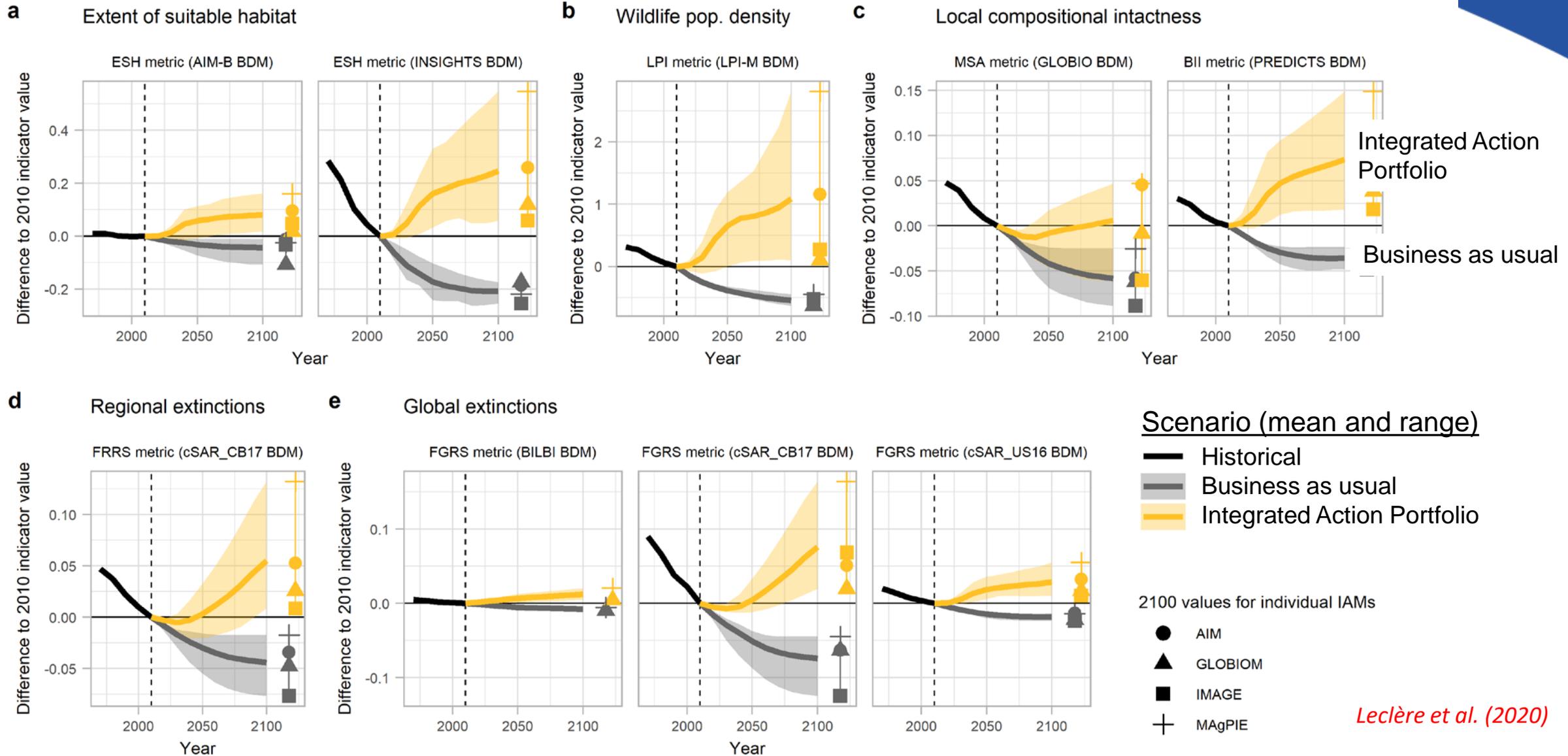**Can we bend the curve of biodiversity loss without jeopardizing other SDGs?**

If yes, what can we robustly say about how to get there?

> New global scenarios exploring the action space

> New multi-model assessment of these scenarios

Leclère et al. (2020)

11th Dec 2022
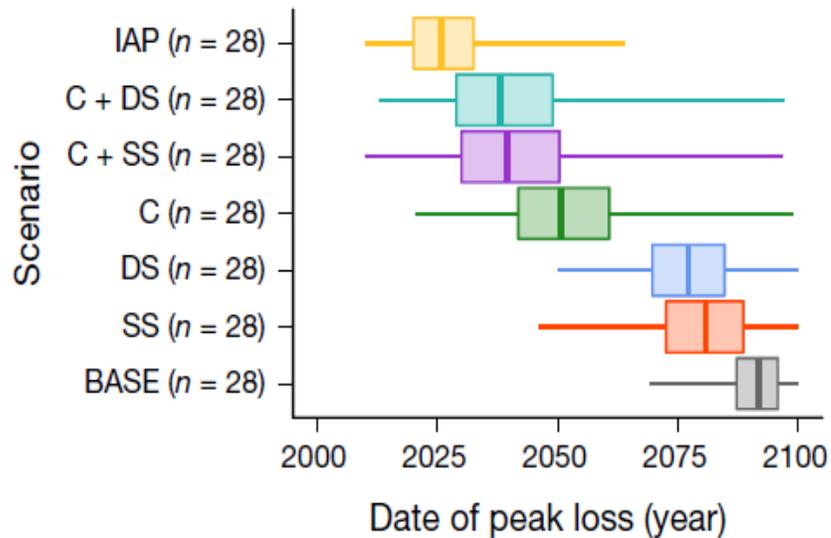
P. Leadley & D. Leclère, 5th Science-Policy Forum for Biodiversity

Scenarios exploring the actions space

Supply side

Sustainably increased crop yields

Sustainably increased trade of agricultural goods

Increased restoration & landscape-level planning

Conservation

More & better managed conservation areas

All three = Integrated Action Portfolio

Reduced waste from farm to fork

Diet shift to reduce overconsumption of animal products

Demand side

Leclère et al. (2020)

a Extent of suitable habitat
b Wildlife pop. density
c Local compositional intactness
d Regional extinctions
e Global extinctions

ESH metric (AIM-B BDM)
ESH metric (INSIGHTS BDM)
LPI metric (LPI-M BDM)
MSA metric (GLOBIO BDM)
BII metric (PREDICTS BDM)
FRRS metric (cSAR_CB17 BDM)
FGRS metric (BILBI BDM)
FGRS metric (cSAR_CB17 BDM)
FGRS metric (cSAR_US16 BDM)

Integrated Action Portfolio
Business as usual

Scenario (mean and range)
— Historical
— Business as usual
— Integrated Action Portfolio

2100 values for individual IAMs
● AIM
▲ GLOBIOM
■ IMAGE
+ MAgPIE

Leclère et al. (2020)

How fast do we get there?

When do we bend?

How much do we loose before bending?

Scenario

Business-as-usual (BASE)

Supply side (SS)

Demade side (DS)

Conservation (C)

Conservation + SS (C+SS)

Conservation + DS (C+DS)
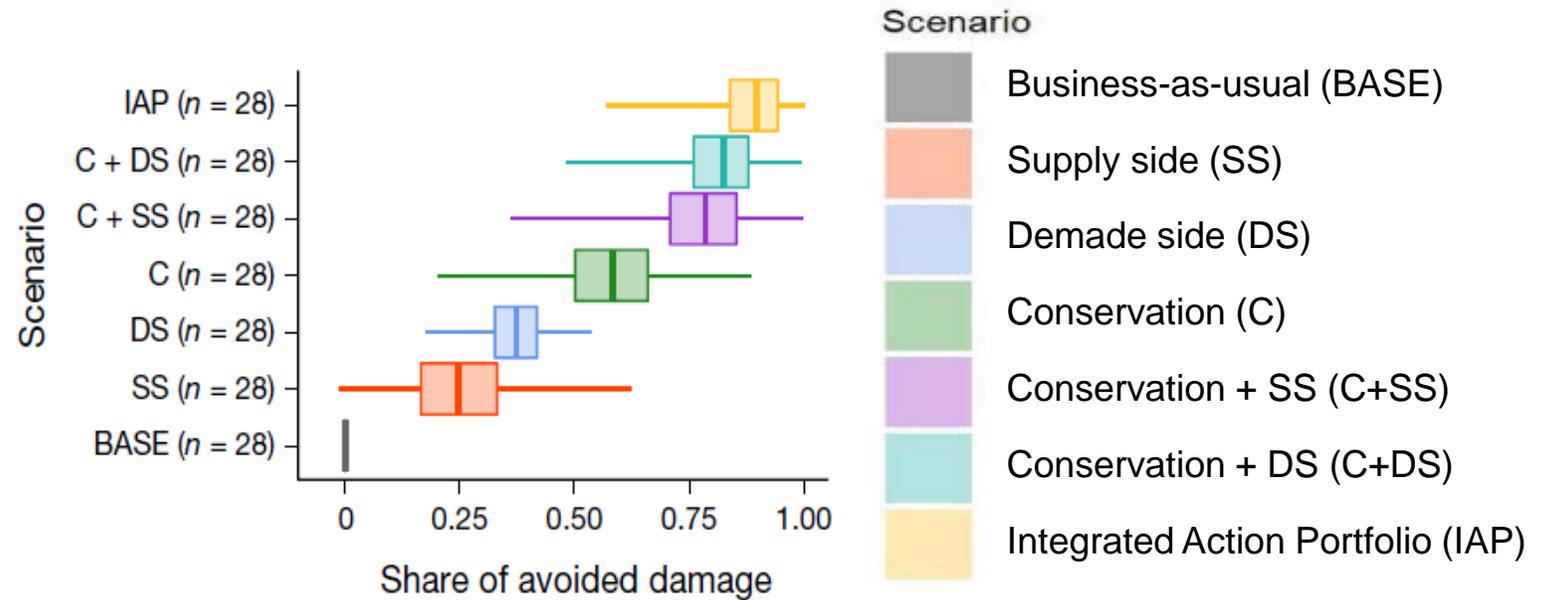
Integrated Action Portfolio (IAP)
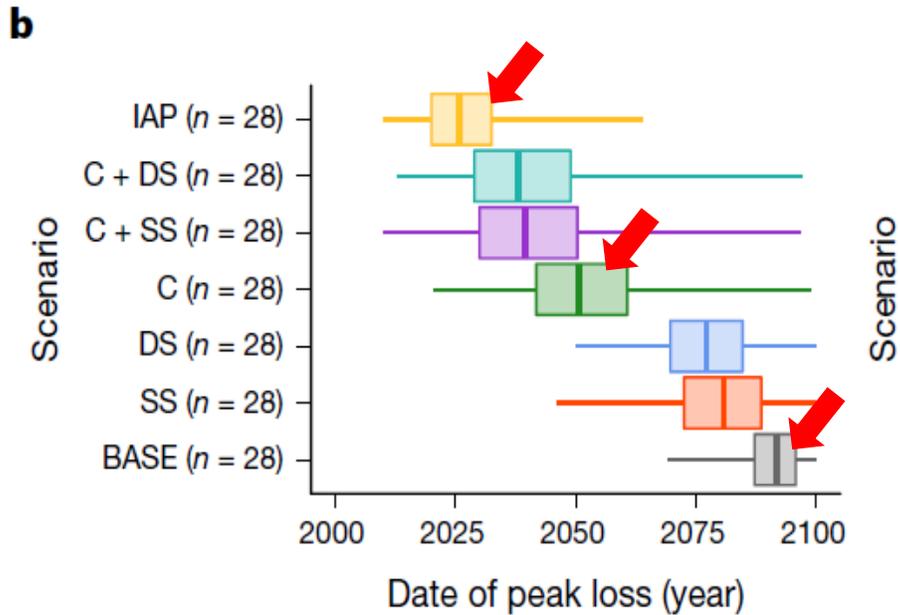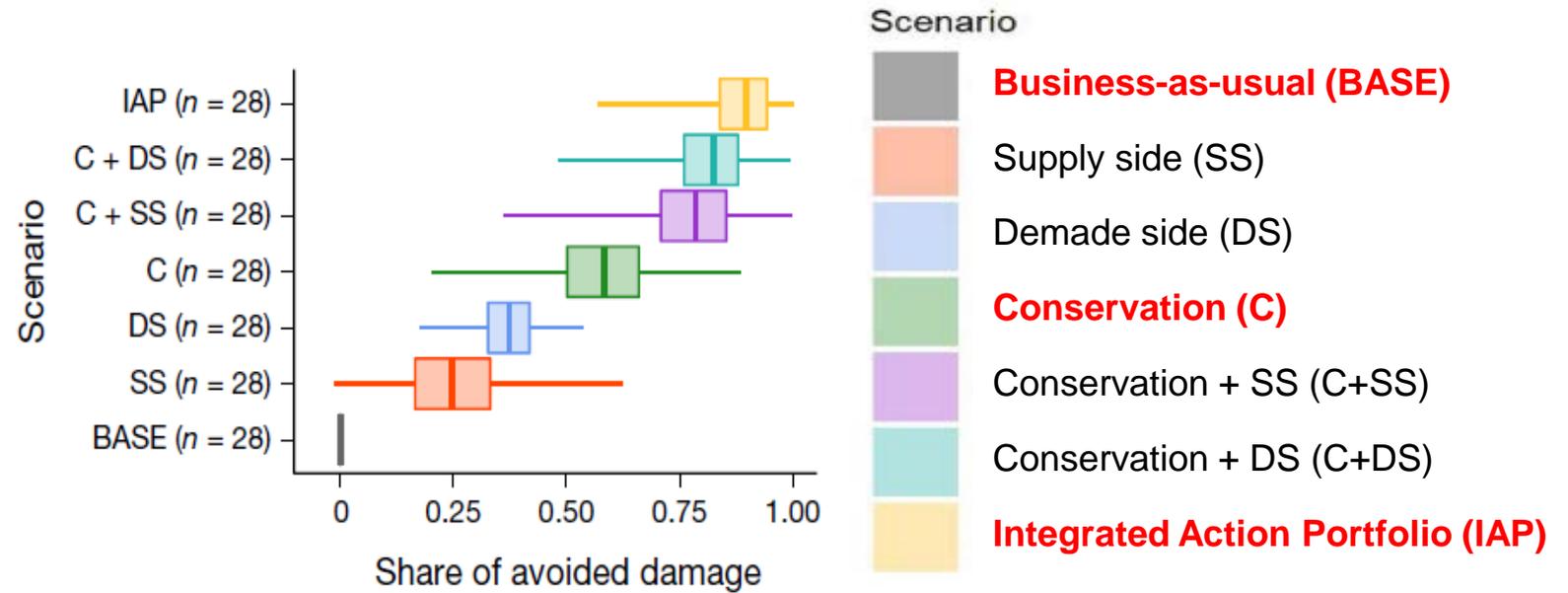
Leclère et al. (2020)

How fast do we get there?

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Leclère et al. (2020)

How do we get there?

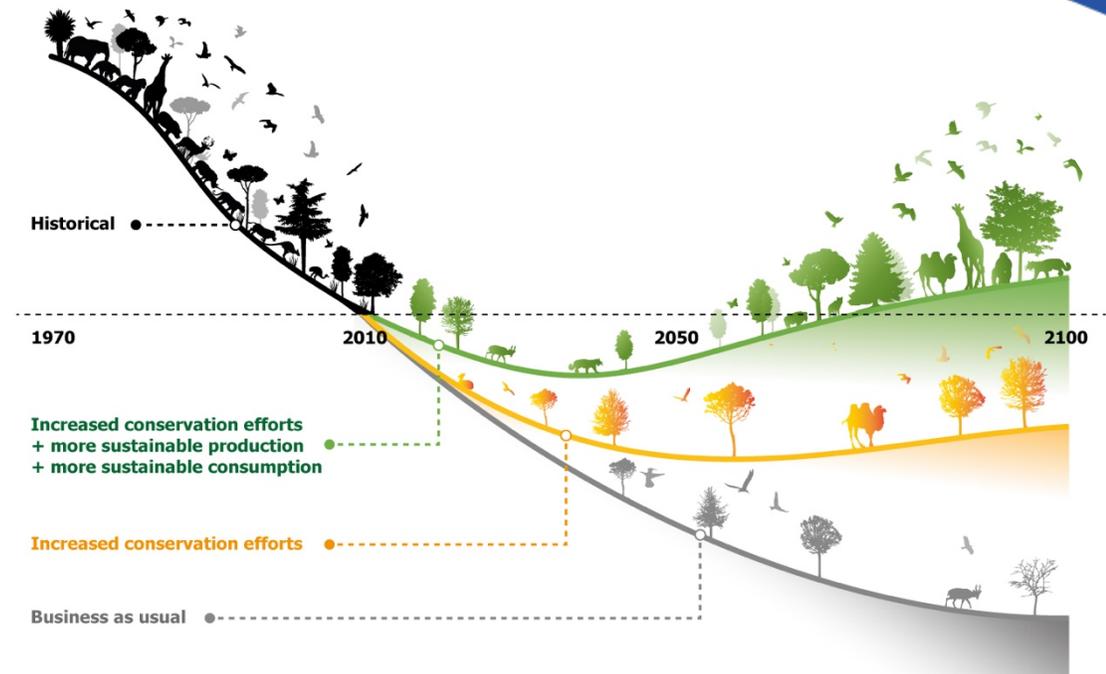**Increased conservation efforts are key …**

More and better managed PAs **AND** restoration **AND** landscape-level conservation planning:

- o Advances the date at which we reach peak biodiversity loss by several decades
- o Biodiversity is set on track for recovery

Leclère et al. (2020)

How do we get there?

Increased conservation efforts are key ...

but are not enough!

Historical

1970   2010   2050   2100

Increased conservation efforts
+ more sustainable production
+ more sustainable consumption

Increased conservation efforts

Business as usual

Only by **additionally** tackling the drivers of habitat loss (via **diet shift, reduced waste, sustainable increases in trade and crop yields**) will we robustly:

o Avoid further habitat losses in the near-term

o Secure bending before 2050

o Keep food prices under control & generates large synergies with health, GHG emissions, water use, fertilizer application etc.

Leclère et al. (2020)

Conclusions

Reversing terrestrial biodiversity declines from habitat loss by 2050 might be feasible

But not without <u>ambitious</u> and <u>integrated</u> action

Post-2020 strategy needs both bold conservation & tackling direct and indirect drivers of land use change

Other threats to biodiversity need to be addressed to fully bend the curve

Leclère et al. (2020)

Additional insights from the GEOBON & Future Earth bioDISCOVERY expert group

A synthesis of bending the curve scenarios: Urgent & integrated transformative change is needed

Progress on milestones and targets

None or little	(dark grey)
Modest	(yellow)
Good or very good	(light green)

Targets (T)	Target elements	Scenario type		
		Continued trends + 30% PA	Conservation and restoration	Transformative change
		Assumptions for scenario types		
Protected areas (T3)	area (30%)			
	effective and representative			
Spatial planning, restoration & species management (T1, 2, 4)	—			
Sustainable use, pollution, invasive species, implementation and mainstreaming	—			
Dimension of biodiversity	Milestone elements	Progress toward 2030 biodiversity milestones		
Ecosystems	area (natural)			
	integrity (natural)			
	connectedness			
	managed ecosystems*			
Species	extinction rate		e.g., birds, mammals	
	threatened status		e.g., invertebrates	
	abundance			
Genetic diversity**	wild			
	domesticated			

*What we do*

Resulting outcomes

Leadley et al. (2022a)

- Conservation actions with a signficant increase in resources is essential, but insufficient by itself to bend the curve

- Only transformative changes addressing all direct and indirect drivers of biodiversity lead to a positive future for nature and people

- There's no bending if we do not achieve the climate mitigation targets of the Paris agreement

How to strengthen the formulation of GBF targets?

Leadley et al. (2022a)

11th Dec 2022

P. Leadley & D. Leclère, 5th Science-Policy Forum for Biodiversity
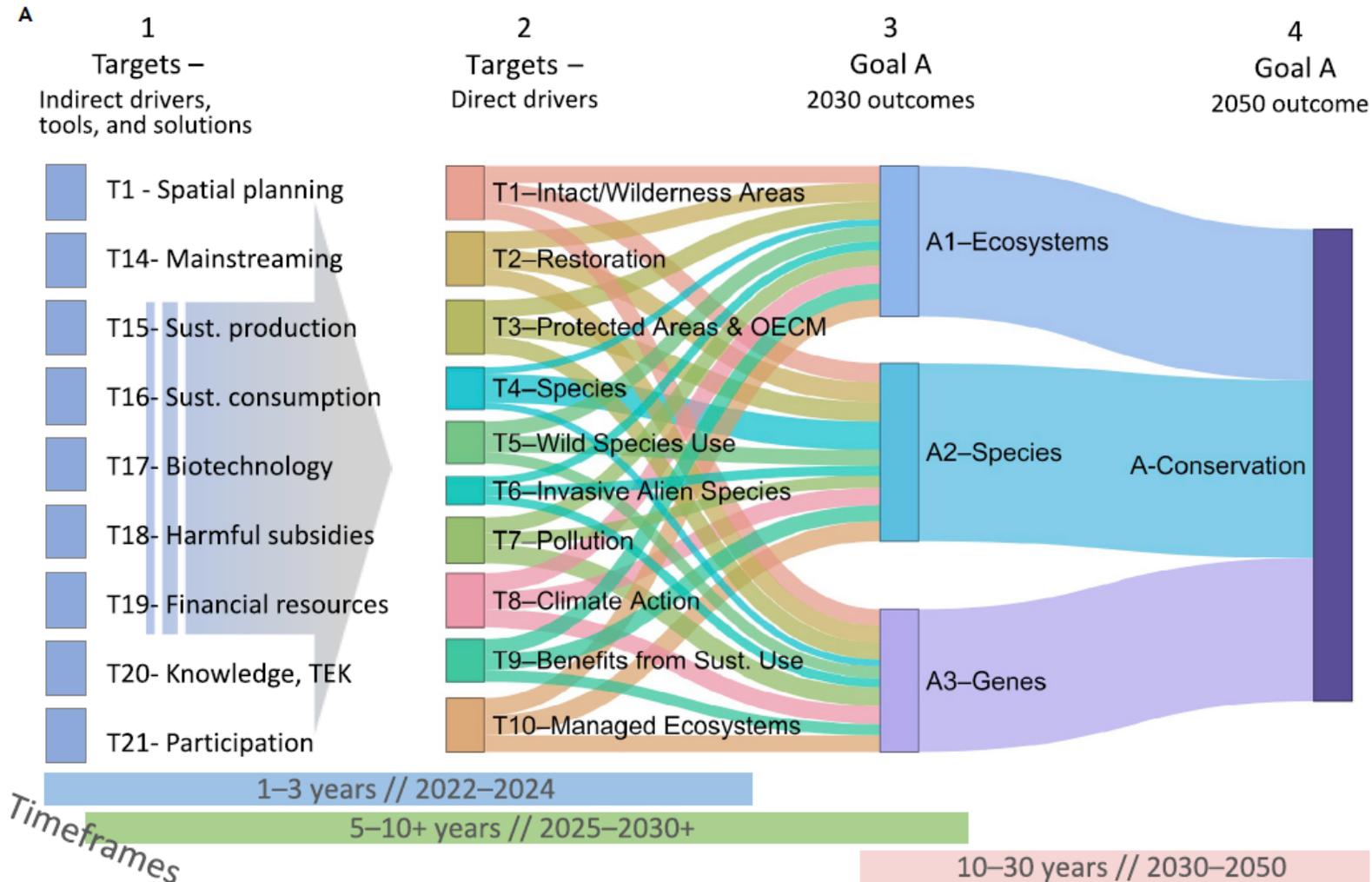
# How to strengthen the formulation of GBF targets?
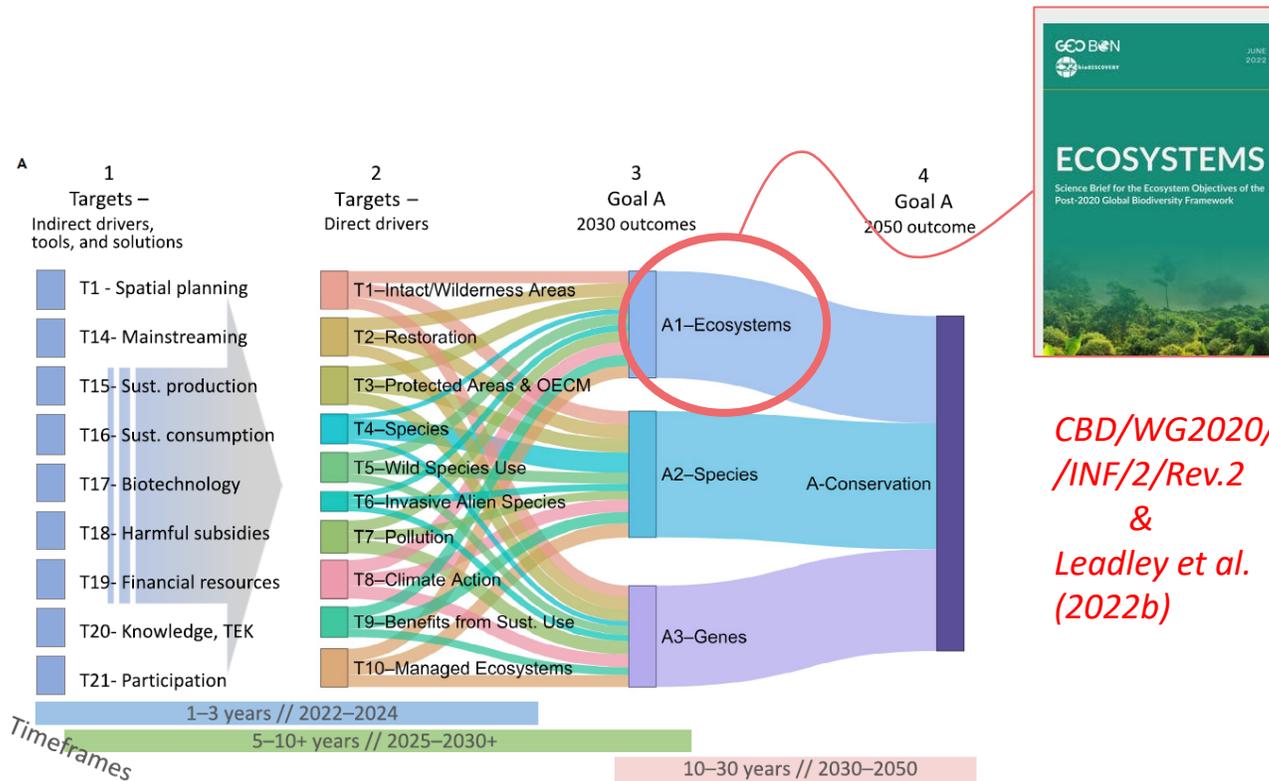
CBD/WG2020/4
/INF/2/Rev.2
&
Leadley et al.
(2022b)

Leadley et al. (2022a)

- Goals of the GBF are very ambitious but within reach with transformative change

- Net gain formulation of Goal A for ecosystem area and integrity requires good safeguards

- Clear definitions & consistent wording are essential for the implementation, monitoring, and coherence of the GBF

- Consistent and quantitative wording is needed for a coherent, traceable & ambitious action across T1-3 / Goal A

- The crafting of fair national commitments cumulatively consistent with global targets would greatly benefit from a dedicated iterative process

The need for a ambitious monitoring framework
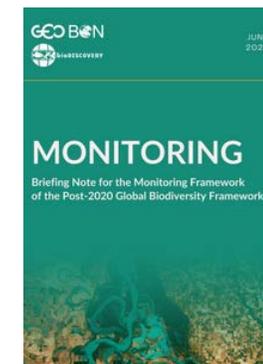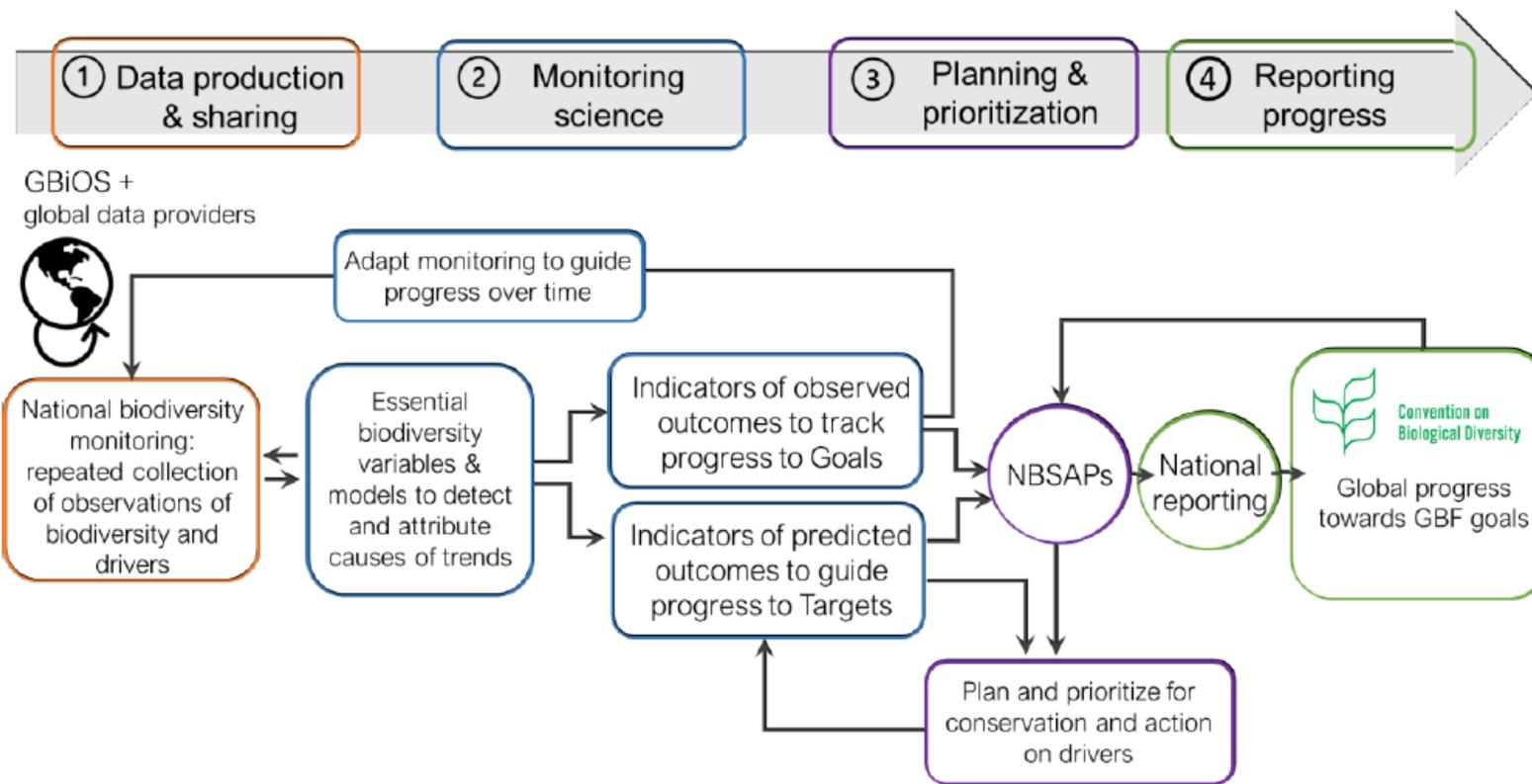
- Successful implementation of the GBF will require substantial investment in monitoring capacity to detect change and attribute drivers.

- It is essential to ensure the supply of, and access to, data to track progress and guide action needed to implement the GBF at local, national and international levels.
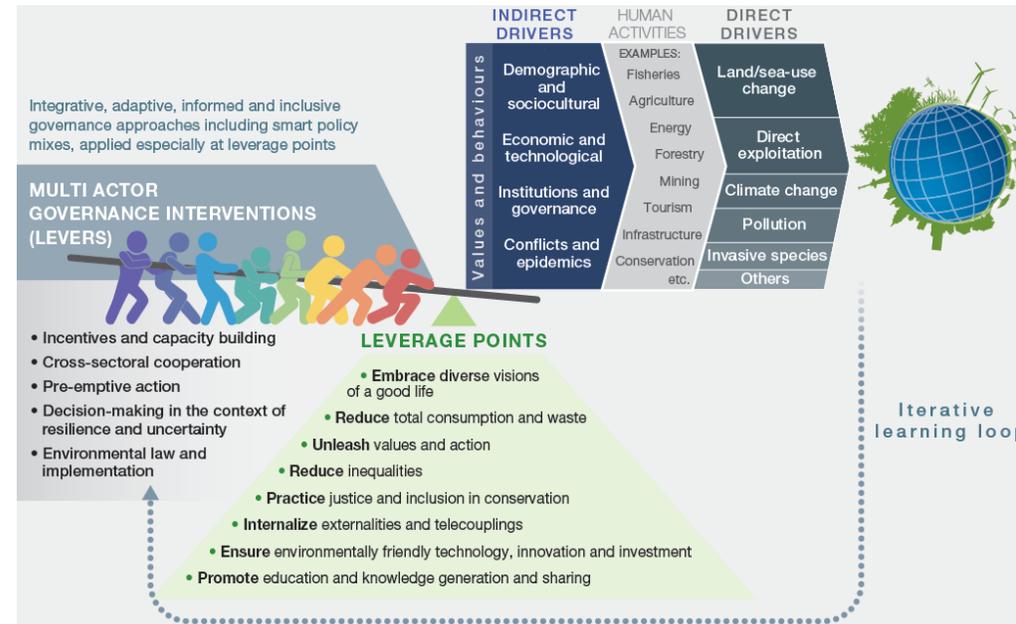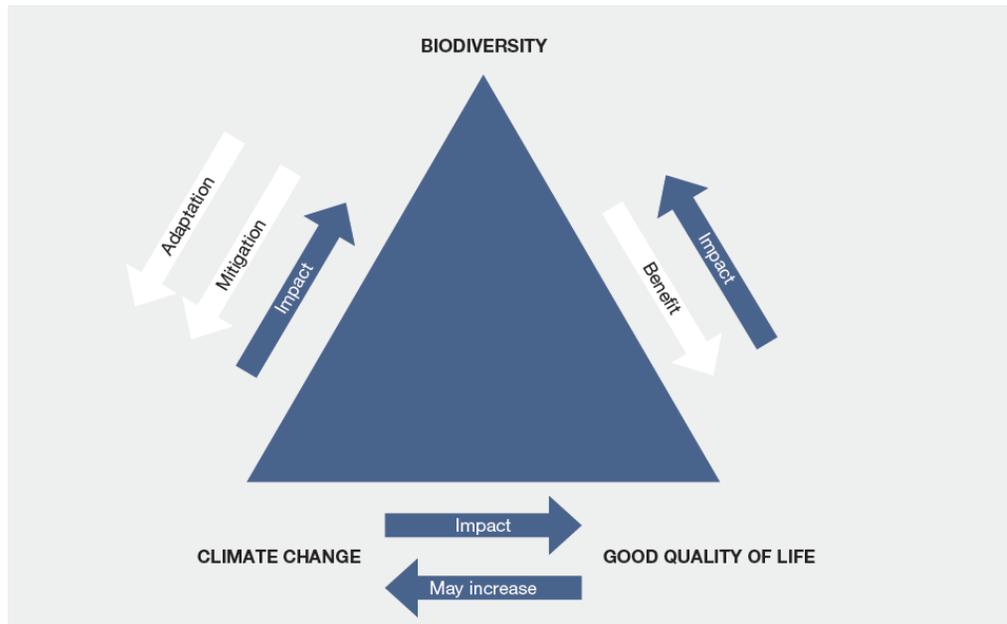
How can models & scenarios help implementation?
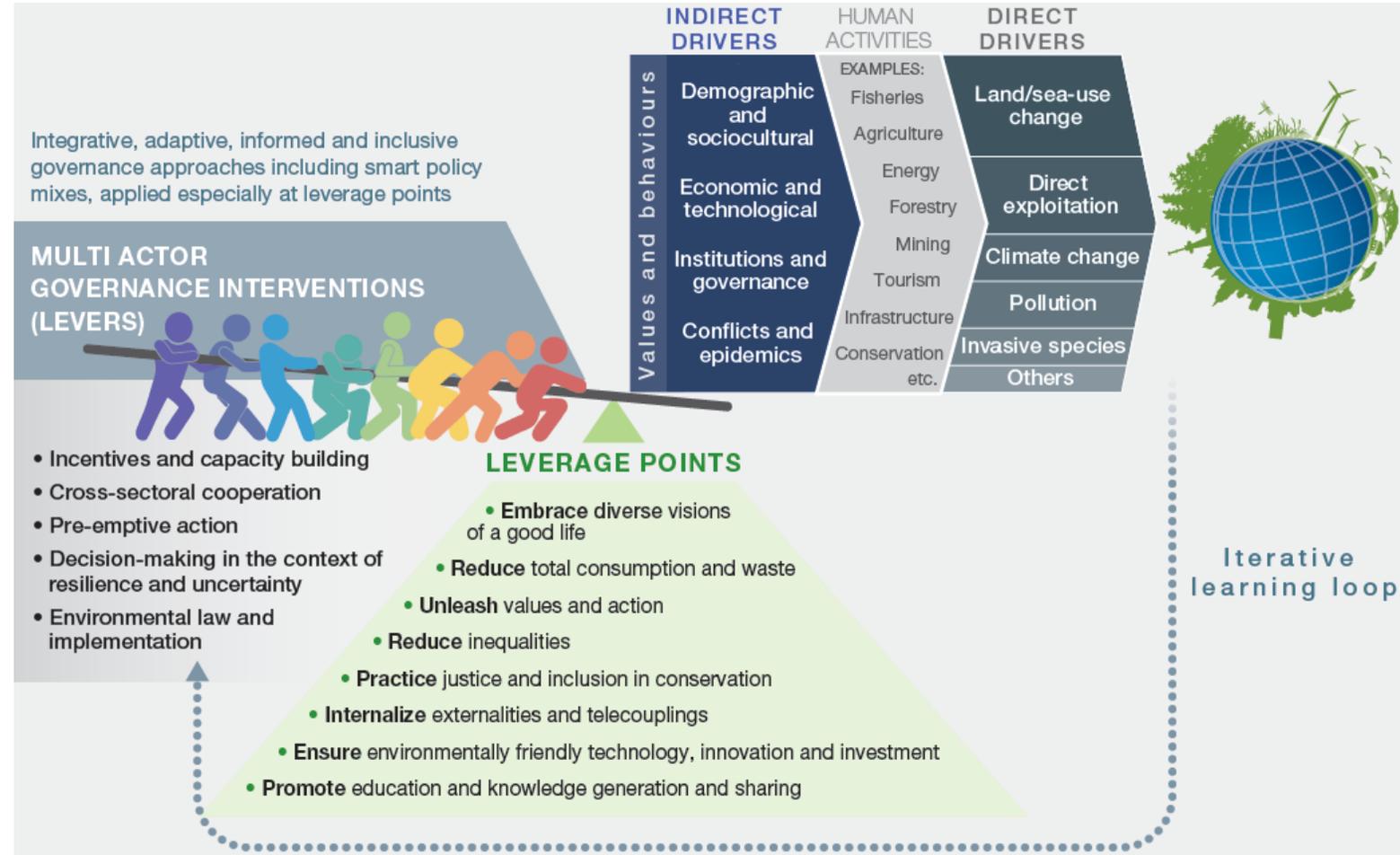
IPBES Global Assessment (2019)

11th Dec 2022

P. Leadley & D. Leclère, 5th Science-Policy Forum for Biodiversity

A broad agenda to research from pathways to policies

A just transition for people, climate and nature ...   that requires transformative change

*IPBES-IPCC co-sponsored workshop (Pörtner et al 2021)*

Framing values & equity considerations

Key equity considerations for implementation:

- Recognition: how are visions, issues and interventions identified as relevant by IPLCs or developing nations framed?

- Distributive justice: are distributions of efforts and impacts across actors fair?

Models and scenarios can be improved & mobilized to explore some of these questions

Tools being developed with IPBES support (Nature Futures framework)
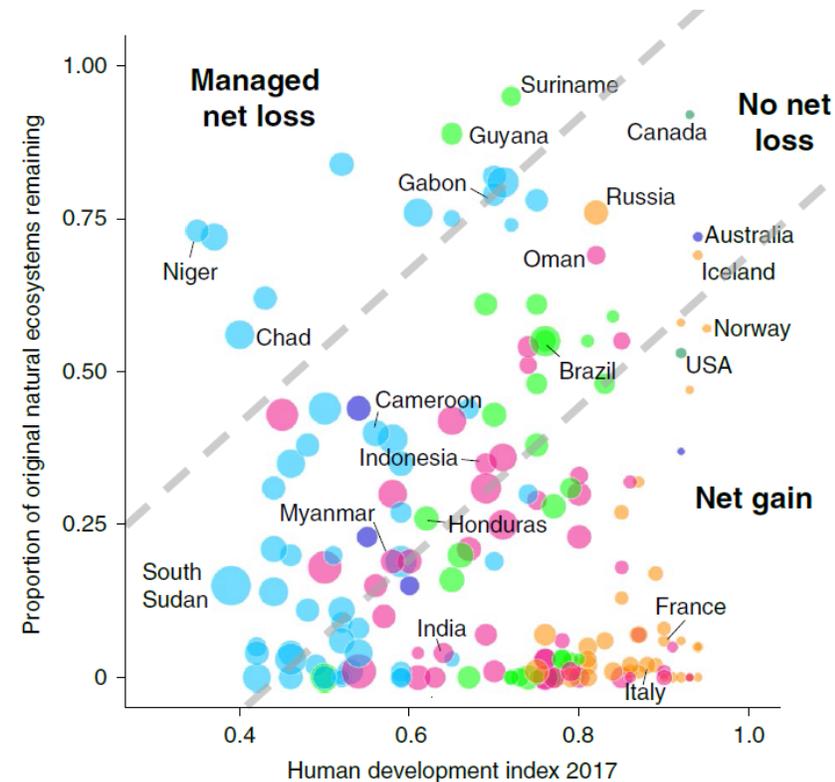
Maron et al (2019)

Example: how could various equity considerations impact the distribution of national contributions to GBF Goal A (net increase in natural ecosystem area)?

The nature futures framework

A flexible tool to support the development of scenarios and models of desirable futures for people, nature and Mother Earth
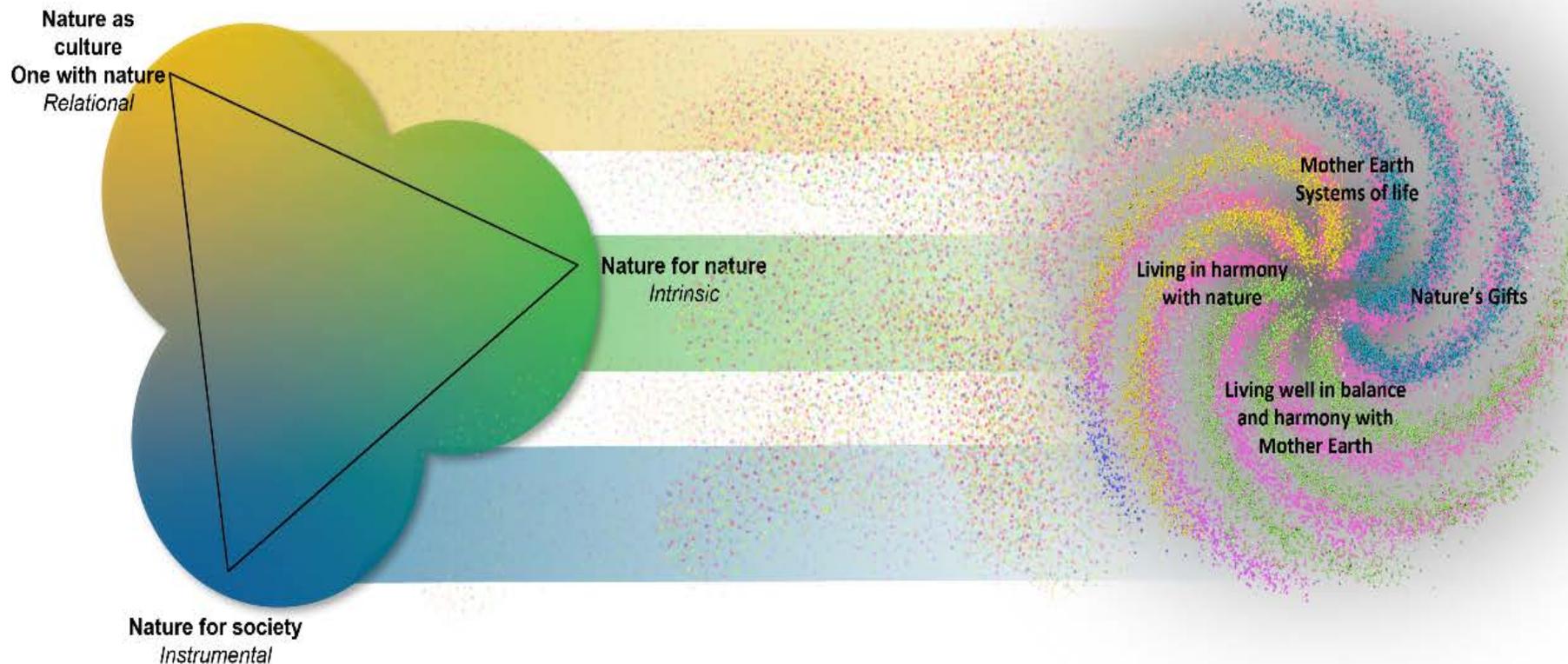
The IPBES Scenarios Task Force is catalyzing the development of bending the curve scenarios that account for diverse values

Support climate & biodiversity policy alignment

Models & scenarios can be instrumental in supporting policies and cross-sectoral policy interactions

Goal of the BIOCLIMA project:

- Improving on existing modeling framework already in use to support the EC in design of climate action

- Explore synergies and trade-offs across interventions for climate and biodiversity

So what about people in "bending the curve" scenarios

An important assumption in most of these scenarios: Bending the curve for biodiversity does not come at the expense of improving food security and eliminating hunger.

Some key assumptions:
- Very large reduction in overconsumption of food and even more specifically of red meat, coupled with more equitable distribution of food.
- Yield gaps are closed, especially in sub-saharan Africa.
- Education for women is improved, which is assumed to affect fertility.
- Energy security is assured for all people, especially from cleaner sources which is assumed to reduce greenhouse gas emissions and environmental health impacts.

There are strong synergies, but also tradeoffs that cannot be ignored. These tradeoffs require changes in people's values, as well as changes in supply and consumption that are contested by vested interests.

International Institute for
Applied Systems Analysis
IIASA www.iiasa.ac.at

A sustainable development pathway for climate action within the UN 2030 Agenda

Bjoern Soergel [1 ✉], Elmar Kriegler [1,2], Isabelle Weindl [1], Sebastian Rauner [1], Alois Dirnaichner[1],

SDP-1.5C   SSP1-1.5C
SSP1-NDC   SSP2-NDC
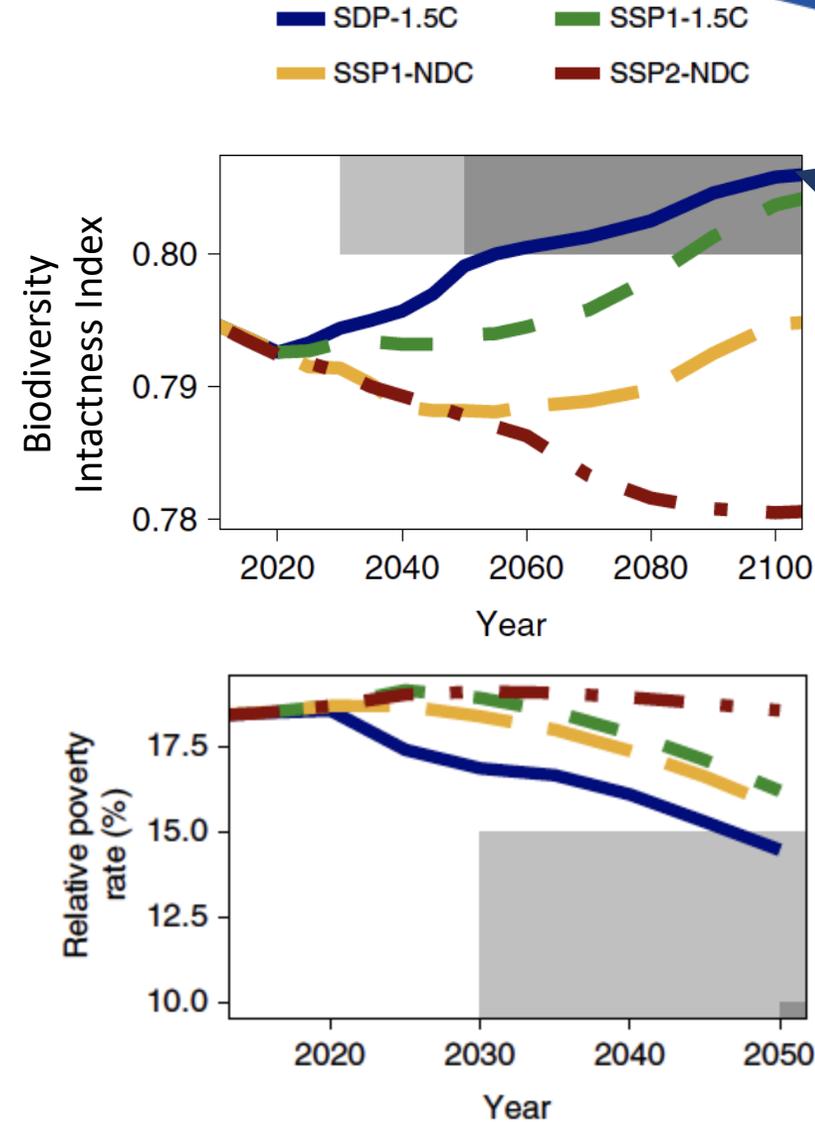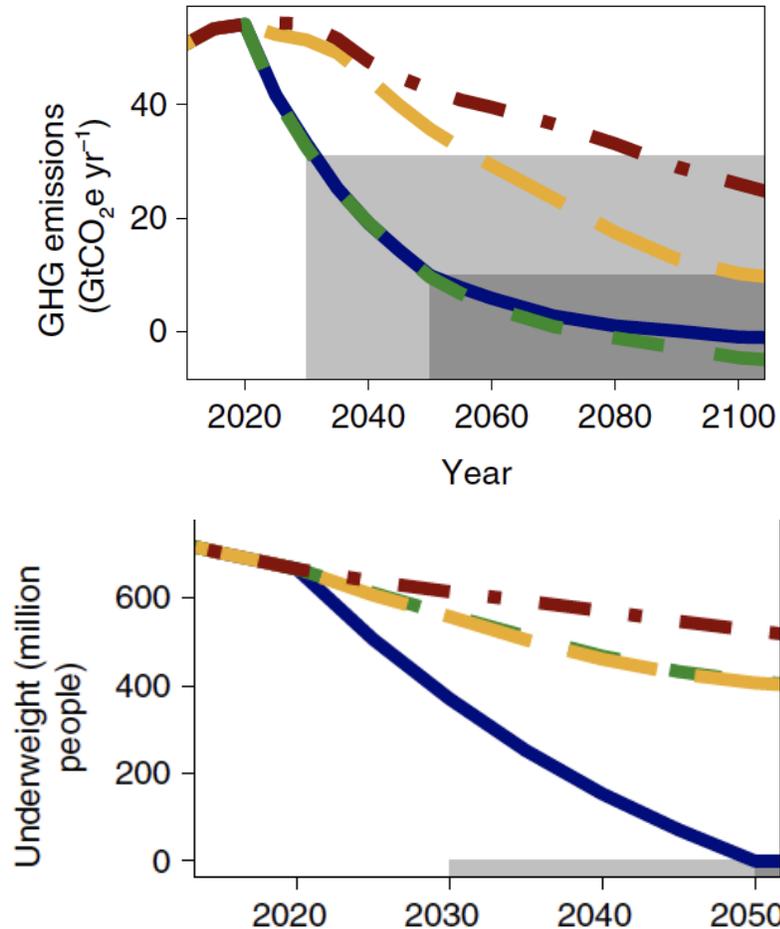
SDP-1.5 = Sustainable Development Pathway, very strong climate mitigation

SSP2-NDC = SSP2 scenario GHG emissions based on NDCs

Take home messages

- Bending the curve of biodiversity loss needs urgent, integrated and transformative action

- The first draft of the GBF had many elements that, if achieved, would initiate bendingn the curve of biodiversity. Keep that high ambition for drivers of biodiversity loss will be key to achieving the 2050 Vision.

- Bending the curve approaches have a lot to offer, but should be further aligned with and address issues of social justice and values.

- Models and scenarios could be instrumental in supporting the GBF implementation, from pathways, to effort sharing to informing policies

Thank you!

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